Owner's Guide

Cascade® 3180 Duo Delivery System & Cascade 4442 Handpiece Control System

a-dec®

85.2621.00

Warranty Information

Serial Number _____

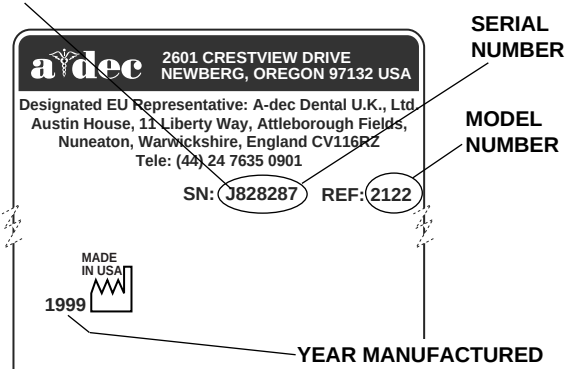
Model Number _____

Date Purchased _____

Date of Service	Model/Description of Service	Technician's Initials

ALPHABETICAL EQUIVALENT TO THE NUMERAL OF THE MONTH MANUFACTURED

A	January
B	February
C	March
D	April
E	May
F	June
G	July
H	August
I	September
J	October
K	November
L	December



SERIAL NUMBER IDENTIFICATION

Serial Number Location:

- The model and serial number tag is located on the bottom of the control head.

For service information contact your local authorized A-dec dealer.

Check with local codes and A.D.A. (Americans with Disabilities Act) requirements for installation of this product.

A-dec warrants its products and A-dec/W&H Synea handpieces against defects in material or workmanship for one year from time of delivery. All other handpiece instrumentation has a warranty period of six months. A-dec's sole obligation under the warranty is to provide parts for the repair, or at its option, to provide the replacement product (excluding labor). The buyer shall have no other remedy. (All special, incidental, and coincidental damages are excluded.) Written notice of breach of warranty must be given to A-dec within the warranty period. The warranty does not cover damage resulting from improper installation or maintenance, accident or misuse.The warranty does not cover damage resulting from the use of cleaning, disinfecting or sterilization chemicals and processes. The warranty also does not cover light bulbs. Failure to follow instructions provided in A-dec's Operation and Maintenance Instructions (Owner's Guide) may void the warranty.

NO OTHER WARRANTIES AS TO
MERCHANTABILITY OR OTHERWISE ARE MADE.

a-dec

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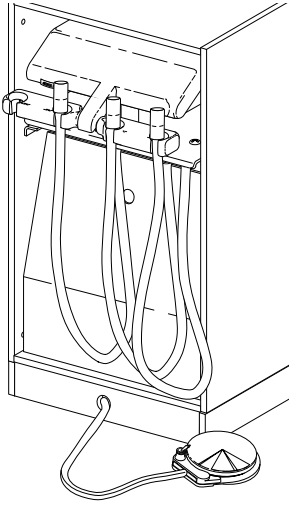
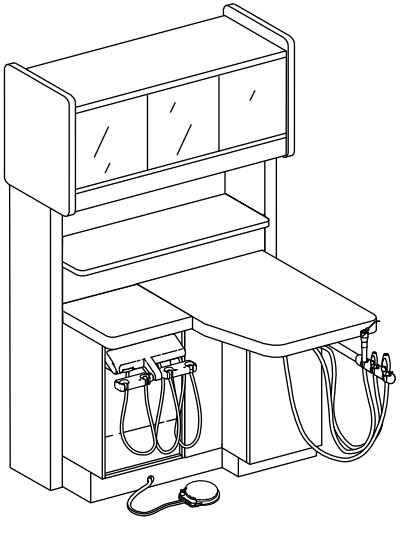
Serial number location, service information, and warranty information are located on the inside front cover and front page.



Cascade 4442 Handpiece Control System



Cascade 3180 Duo Delivery System
(Shown on the Preference® II 5551 Treatment Console.)

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Your Cascade Handpiece Control

Your Cascade Handpiece Control System is built around A-dec's Century Plus® control system for three handpieces. The system also includes the A-dec autoclavable syringe.

Handpiece activation is automatic. When you lift a handpiece from its holder the handpiece becomes active and will run when you press on the foot control disc *(refer to page 5)*.

Adjustment keys *(see Figure 1)* are provided for your use when making adjustments to the recessed controls, including; coolant air, coolant water, and handpiece flush. If the adjustment keys are ever misplaced, you can use a 1⁄8" hex key. You may order additional or replacement keys from your authorized A-dec dealer.

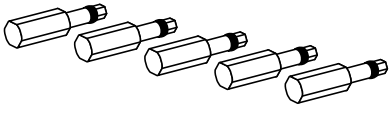

Figure 1. Autoclavable Control Keys

Handpiece Controls

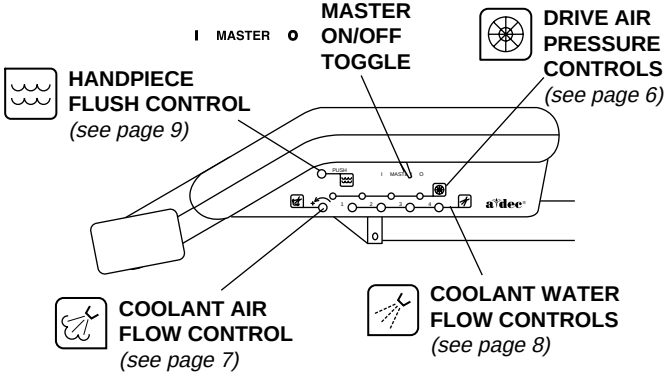

Figure 2. Handpiece Controls

Master On/Off Toggle

I MASTER O

The **master on/off toggle** *(see Figure 2)* turns air, water, and electricity on or off to the system.

CAUTION

The MASTER ON/OFF TOGGLE should be in the OFF (0) position whenever the unit is not in use.

This will prevent the possibility of water damage should a leak occur while the unit is unattended.

Making sure the unit is off will also prevent the possibility of self-activation and the resulting burn-out of your electrical accessories.

Drive Air Pressure Gauge

The drive air pressure gauge *(see Figure 3)* indicates, in psi and kg/cm2, the drive air pressure to the active handpiece *(refer to page 6)*.

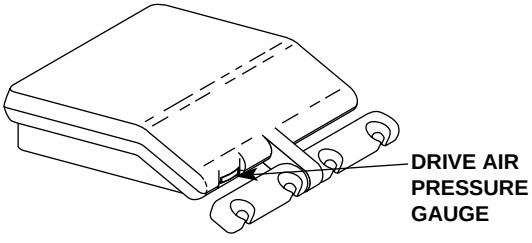

Figure 3. Drive Air Pressure Gauge

Foot Control

The foot control modulates drive air to the active handpiece and provides an air signal that activates the coolant air and coolant water flow. The foot control is operated by light foot pressure applied to any part of the foot control disc.

The foot control is equipped with a wet/dry toggle and can be equipped with an optional chip blower button *(see Figure 4)*.

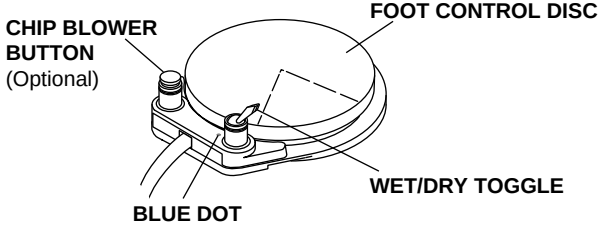

Figure 4. Foot Control

Wet/Dry Toggle. Allows you to shut off the coolant water to the handpiece without moving your hands from the oral cavity. Using your foot, move the toggle away from the blue dot to turn the coolant water OFF. Move the toggle toward the blue dot to turn the coolant water ON.

Chip Blower Button. Sends a jet of air through the handpiece when it is not running.

Drive Air Pressure Controls

The drive air pressure controls *(see Figure 2 on page 3)* are used to adjust the drive air pressure to each handpiece.

Adjust the drive air pressure to meet the handpiece manufacturer's dynamic drive air pressure specification. *Refer to the documentation that came with your handpiece for the dynamic drive air pressure specification.*

You will need a 3⁄32" hex key to complete this adjustment.

1. Install a bur in the handpiece.
2. Locate the drive air gauge on the front of the control head *(see Figure 3 on page 4)*.
3. Move the wet/dry toggle on the foot control *(see Figure 4 on page 5)* to the OFF position, *away from the blue dot)*.
4. Turn the drive air control clockwise until the valve seats.
5. Fully depress the foot control disc.
6. While running the handpiece, watch the drive air gauge and adjust the handpiece dynamic drive air pressure to meet manufacturer's specifications.
   - Turn the drive air control counterclockwise to increase drive air pressure flow.
   - Turn the control clockwise to decrease flow.

NOTE

Do not turn the control counterclockwise beyond the point where the drive air pressure no longer increases. The control adjustment screw may come completely out of the unit.

7. Repeat steps 1 through 6 for ***EACH*** handpiece.

Coolant Air Flow Control

The coolant air flow control *(see Figure 2 on page 3)* is used to adjust the coolant air flow to all handpieces.

You will need an adjustment key (see Figure 1 on page 2) or a 1⁄8" hex key to complete this adjustment.

1. Install a bur in the handpiece.
2. Locate the coolant air control *(see Figure 2 on page 3)*.
3. Move the wet/dry toggle on the foot control *(see Figure 4 on page 5)* to the OFF position, *away from the blue dot*.
4. Insert an adjustment key, or a 1⁄8" hex key, into the coolant air flow control.
5. Fully depress the foot control disc to activate the handpiece.
6. Adjust the coolant air flow to fit your needs. A strong flow of air is recommended.
   - Turn the control clockwise to decrease the flow.
   - Turn counterclockwise to increase the flow.
7. The coolant air has been set for **ALL** handpieces.

Coolant Water Flow Controls

The coolant water flow controls are used to adjust the flow of coolant water to each handpiece *(see Figure 2 on page 3)*.

You will need an adjustment key (see Figure 1 on page 2) or a 1⁄8" hex key to complete this adjustment.

1. Install a bur in the handpiece.
2. Locate the coolant water flow controls *(see Figure 2 on page 3)*.
3. Move the wet/dry toggle on the foot control *(see Figure 4 on page 5)* to the ON position, *toward the blue dot*.
4. Insert an adjustment key, or a 1⁄8" hex key, into the coolant water flow control for the handpiece being adjusted.
5. Hold the handpiece over a receptacle. Be sure to hold the handpiece so that the water will be directed away from you and into the receptacle.

   Then, fully depress the foot control disc to activate the handpiece.
6. Adjust the coolant water flow to fit your needs.
   - Turn the control clockwise to decrease the flow.
   - Turn counterclockwise to increase the flow.
7. Adjust the coolant water for **EACH** handpiece.

Handpiece Tubing Flush

The handpiece tubing flush system flushes more water through the tubings in less time than is normally possible when operating the foot control only. The handpieces should not be connected when flushing the tubings.

How Often Should the Handpiece Tubings be Flushed?

After Each Patient:

Flush the tubings for about 20–30 seconds.

At the Beginning of Each Day:

Flush the tubings for 2–3 minutes.

Flushing the Handpiece Tubings

Gather up all the handpiece tubings that use coolant water and hold them over a sink, cuspidor bowl or basin. Be sure you hold the tubings so that the water will be directed away from you and into the receptacle *(see Figure 5)*.

Insert an adjustment key or 1⁄8" hex key into the handpiece tubing flush control on the side of the control head. Push in and hold the key for the appropriate time required, either for flushing between patients or flushing at the beginning of each day, depending on the situation. Remove the key and replace the tubings in their holders.

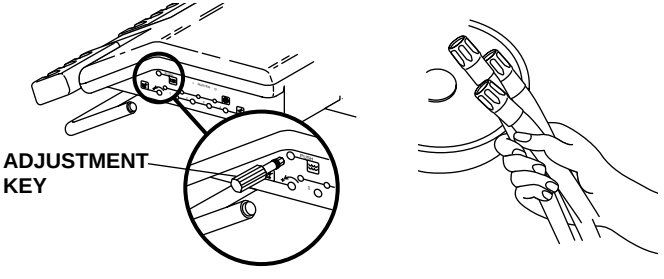

Figure 5. Handpiece Tubing Flush

Handpiece Holder Tension Adjustment & Positioning

The holder tension was set at the factory. However, if a holder is difficult to reposition or repositions too easily, the holder tension can be adjusted.

To adjust the holder tension:

- Loosening or tightening the tension adjustment screw shown in Figures 6A and 6B.

To reposition a holder:

- Rotate the holder to the desired angle.

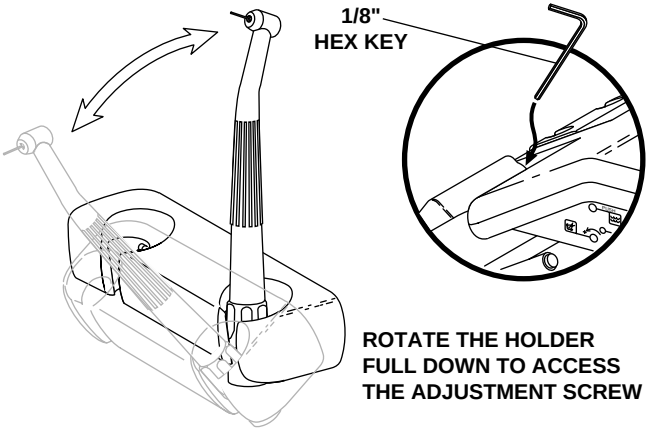

Figure 6A. Unitized Handpiece Holder

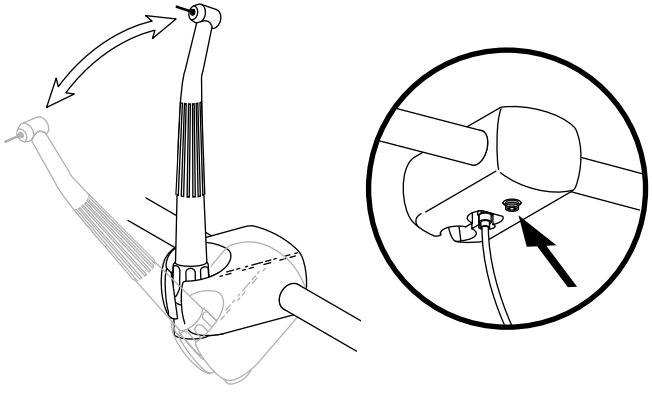

Figure 6B. Individual Handpiece Holder

Handpiece Dry Block Conversion

Your Cascade handpiece control system has one to four handpiece control blocks with coolant water to the handpiece. In some cases a control block without coolant water, a dry block, is required. If you require a dry block (offering no water to the handpiece) on your handpiece control system, a dry block conversion kit has been included with your system.

Installing the Dry Block Conversion Kit

1. Move the master on/off toggle to the OFF position. Bleed the system water by operating the syringe and flushing the handpiece tubings.
2. Locate the handpiece control block position that will be the dry block. Access the control blocks underneath the control head.
3. Use a 3/32" hex key to remove the large red cartridge from the control block. Install the large black cartridge from the dry block conversion kit into the control block *(see Figure 7)*.
4. Use a 3/32" hex key to remove the small blue cartridge from the same control block. Install the small black cartridge from the dry block conversion kit into the control block *(see Figure 7)*.
5. Turn your handpiece control system on, then check the function of the dry block handpiece conversion. A small amount of residual water may be discharged from the handpiece tubing but should dry after a few seconds.

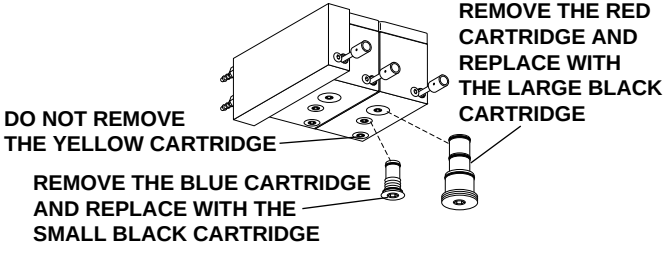
REMOVE THE RED CARTRIDGE AND REPLACE WITH THE LARGE BLACK CARTRIDGE
DO NOT REMOVE THE YELLOW CARTRIDGE
REMOVE THE BLUE CARTRIDGE AND REPLACE WITH THE SMALL BLACK CARTRIDGE

Figure 7. Handpiece Dry Block Conversion

Oil Collector

The oil collector gauze on your unit needs to be changed once a week for normal usage. Change more often for heavier use.

1. Remove the oil collector jar from the unit and discard the old gauze (*see Figure 8*).
2. Fold in quarters a new two inch square gauze pad and place against the spring inside the jar.
3. Screw the oil collector jar onto the unit. Do not overtighten.

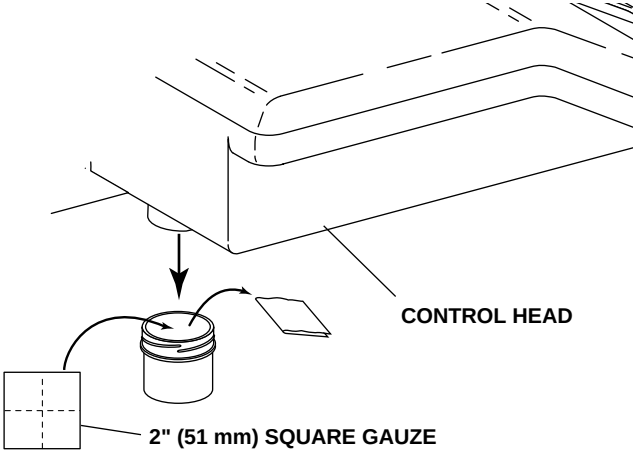

Figure 8. Oil Collector

Syringe

To operate the syringe *(see Figure 9)*:

- Move the on/off toggle to the ON position.
- Air – Press the right button down.
- Water – Press the left button down.
- Spray – Press both buttons down.

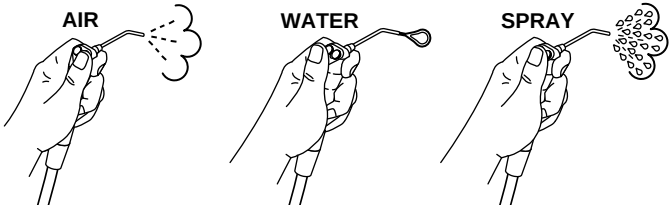

Figure 9. Autoclavable Syringe

Refer to your ***Autoclavable Syringe Owner's Guide*** *(A-dec Publication No. 85.0680.00)* for complete syringe operation and maintenance instructions.

Care Instructions

For recommended asepsis instructions, refer to your ***Equipment Asepsis Owner's Guide*** *(A-dec Publication No. 85.0696.00)*.

For recommended self-contained water system care, refer to ***A-dec Self-contained Water System Owner's Guide*** *(A-dec Publication No. 85.0675.00)*.

Assistant's Instrumentation (3180 only)

Autoclavable HVE & Autoclavable Saliva Ejector

To operate the autoclavable HVE and saliva ejector, simply turn the control valve.

The autoclavable HVE and saliva ejector can be easily converted for right- or left-hand operation. To convert, press the control valve out of the valve body *(see Figure 10)*. Rotate the control valve 180°, then press it back into the valve body.

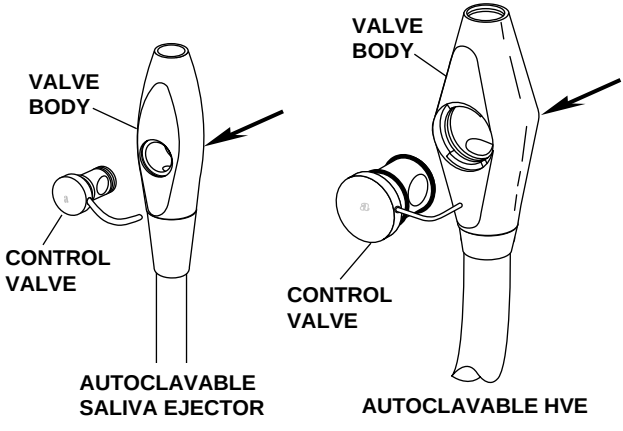

Figure 10. Right- to Left-Hand Conversion

Refer to your ***Assistant's Instrumentation Owner's Guide*** *(A-dec Publication No. 85.2610.00)* for complete instructions on cleaning your HVE and saliva ejector.

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Solids Collector

The solids collector *(see Figure 11)* prevents solids from entering the central vacuum system.

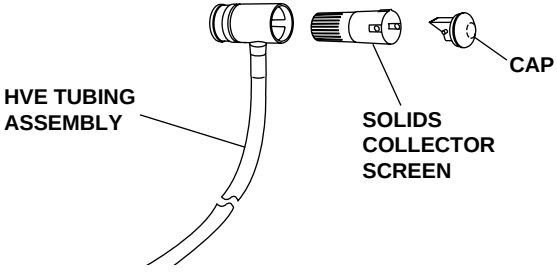

Figure 11. Solids Collector

Refer to your ***Assistant's Instrumentation Owner's Guide*** *(A-dec Publication No. 85.2610.00)* for complete solids collector maintenance instructions.

Utility Area Controls and Functions

To access the utility area, simply lift out the angled lower cover located under the control head.

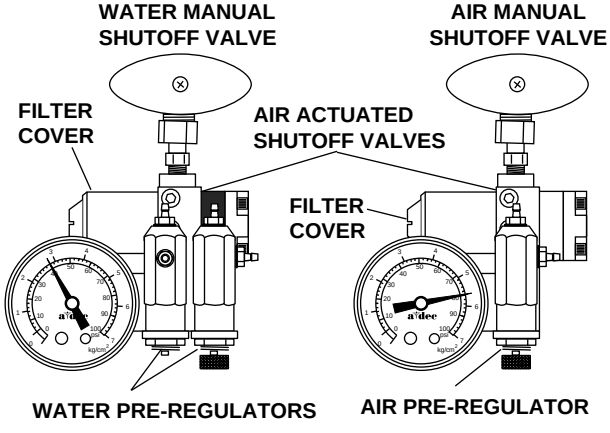

Figure 12. Utility Controls

Air and Water Manual Shutoff Valves

Shutoff valves control the air and water to the unit. To prevent leaks, these valves should remain fully open (turned counterclockwise) except while your unit is being serviced.

Air-actuated Air and Water Shutoff Valves

The **air-actuated air and water shutoff valves** automatically shut off air and water to the system when the master on/off toggle *(see Figure 2 on page 3)* is in the OFF position. This safety feature prevents water damage in the event the unit should develop a water leak while the unit is unattended.

Air and Water Filters

Filters prevent solids from entering the unit. The procedures for checking and replacing the filters are given on pages 22 through 23.

Air and Water Pressure Pre-Regulators

Pre-regulators control the air and water pressures in the unit. The procedure for adjusting system pressure is given on page 20 and 21.

Power Supplies

Your system may include A-dec's 17 watt power supply or 300 watt power supply. No cleaning or maintenance is required to maintain the power supply.

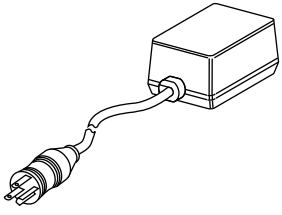

Figure 13. 17 Watt Power Supply

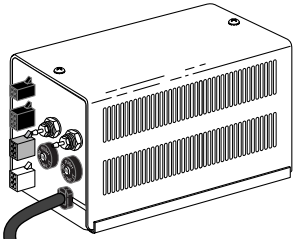

Figure 14. 300 Watt Power Supply

> ***NOTE***
>
> The master on/off toggle switches the control head, dental light, auxiliary cable, and the indicator light on or off.

If a problem arises with the power supply or an A-dec electrical accessory to the power supply, call your authorized A-dec dealer.

Gravity Drain

The **Gravity Drain** (a "T" fitting) *(see Figure 15)* is connected to the office waste drainage system and provides for the disposal of water and debris from the unit.

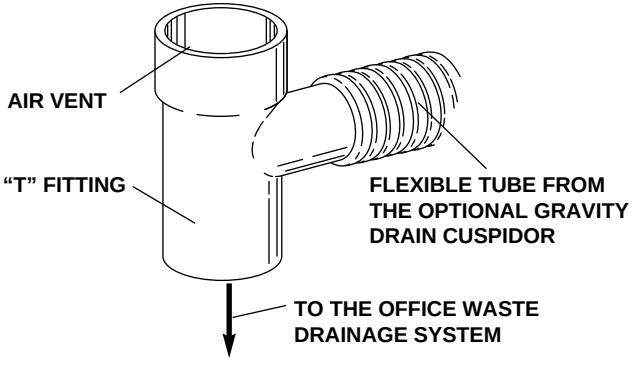

Figure 15. Gravity Drain and Air Vent

The **Air Vent** (the open end of the "T" fitting) prevents air being trapped in the office waste drainage system. If the vent becomes obstructed, waste water and debris may backup into the unit.

If A-dec's optional circulating warm water syringe is included with your unit, a water drip tube will be positioned over the drain air vent. The drip tube is the outlet for warm water supplied to your syringe by the water heater. For more information about your syringe, refer to your ***Autoclavable Syringe Owner's Guide***, *A-dec Publication No. 85.0680.00*.

Vacuum Outlet (3180 only)

The office central **Vacuum System Outlet** is located in the utility center. A flexible tube connects your vacuum instruments to the outlet.

For information about your assistant's vacuum instruments, refer to ***Assistant's Instrumentation Owner's Guide*** *(A-dec Publication No. 85.2610.00)*.

System Air and Water Pressure Adjustments

The air and water pre-regulators are located in the utility center. To access the utility area, simply lift out the angled lower cover located under the control head. Before making any adjustments, verify that the air compressor is turned on and that it maintains 80–100 psi (552–690 kPa) pressure in the tank. If it doesn't, refer to the compressor instructions.

1. Be sure that the manual shutoff valves are fully open (counterclockwise). Turn the system ON, and check the pressure gauges in the utility area *(see Figure 14)*. Air pressure should be 70–80 psi (483–552 kPa) while water pressure should be 35–40 psi (241–276 kPa).
2. While watching the gauges, operate the syringe. If the system air pressure drops by any more than 15 psi (103 kPa), or water pressure by more than 10 psi (69 kPa), check for clogged filters.

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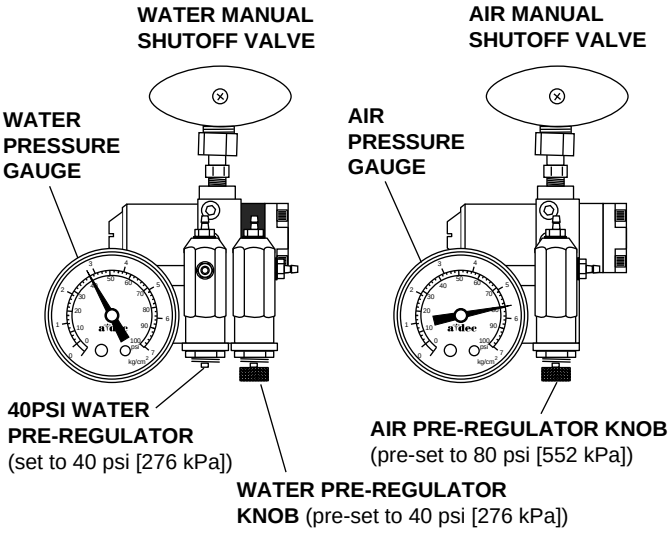
WATER MANUAL SHUTOFF VALVE
AIR MANUAL SHUTOFF VALVE
WATER PRESSURE GAUGE
AIR PRESSURE GAUGE
40PSI WATER PRE-REGULATOR (set to 40 psi [276 kPa])
AIR PRE-REGULATOR KNOB (pre-set to 80 psi [552 kPa])
WATER PRE-REGULATOR KNOB (pre-set to 40 psi [276 kPa])

Figure 16. Air and Water Pressure

3. If adjustment of either the air or water pressure is required, turn the appropriate pre-regulator knob clockwise to increase pressure, or counterclockwise to decrease.

NOTE

When decreasing system air or water pressure, you will not see the air or water pressure gauge in the utility center change until you relieve pressure from the system. Activate the syringe for a few seconds, then check the gauge. Repeat this process each time you make an adjustment to decrease pressure.

4. Test the unit by operating the syringe and handpieces for several seconds. Make sure the air and water pressure is maintained.

Filter Maintenance

Air and Water Filter Elements

Air and water pass through separate filters before entering the regulators. Clogged filters restrict flow to the regulator and should be replaced immediately.

Checking for a Clogged Air Filter

To check for a clogged air filter, move the master on/off toggle to the ON position, then remove the utility area cover under the control head. While watching the air pressure gauge in the utility area *(see Figure 15)*, press the syringe air button. If the air pressure indicated by the gauge drops by more than 15 psi (103 kPa), the filter element is clogged and must be replaced.

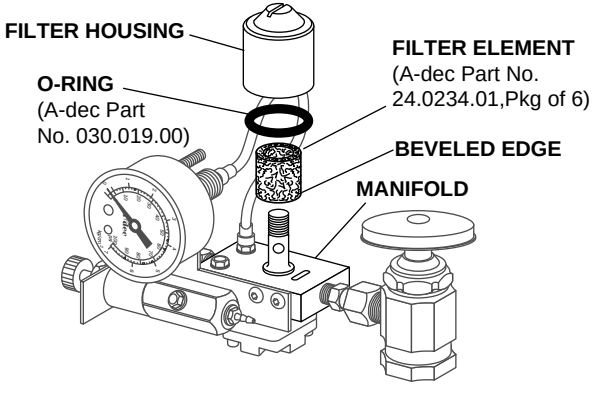

Figure 15. Air or Water Filter Replacement

Checking for a Clogged Water Filter

To check for a clogged water filter, move the master on/off toggle on the control head to the ON position, then remove the control head utility area cover. Watch the water gauge, press the syringe water button. If the water pressure drops by more than 10 psi (69 kPa), the water filter is clogged and must be replaced.

Inspecting the Filters

To inspect or replace a filter element, move the master on/off toggle to the OFF position, then close the manual shutoff valves. Bleed the system of air and water pressure by operating the syringe buttons until no more air and water flow. Using a flat-blade screwdriver, remove the filter housing from the air and/or water pre-regulator assemblies *(see Figure 15)* and remove the filter.

If the filter is visibly clogged or discolored, you will need to replace it. *Order A-dec Part No. 24.0234.00, or 24.0234.01 for a package of six.*

When installing a new filter, notice that one end of the filter has a beveled edge. Install the filter with the beveled edge facing the manifold *(see Figure 15)*. The system will not work properly if the filter is installed incorrectly.

Water Screen

The manual water shutoff valve *(see Figure 16)* in the utility area is equipped with a **Water Screen** to prevent debris from entering the system. You should periodically check and replace this screen to ensure unrestricted water flow to your Cascade unit.

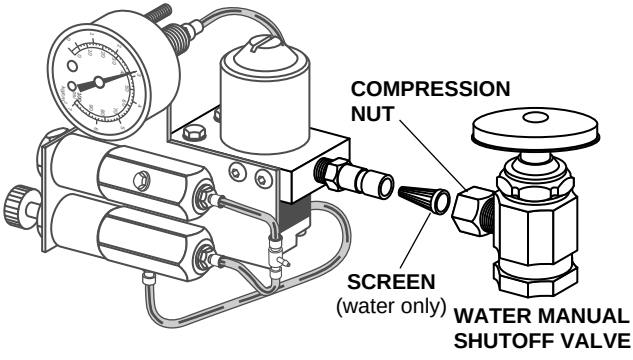

Figure 16. Water Screen Replacement

You will need: One A-dec Screen Kit *(Part No. 41.0004.00)* and a 5/8" open-end or an adjustable wrench.

Products List | Print | Table of Contents

To remove or replace a water filter screen *(see Figure 16)*:

1. Move the master on/off toggle to the OFF position *(see Figure 2 on page 3)*.
2. Close the manual water shutoff valve.
3. Using the 5⁄8" or an adjustable wrench, loosen the compression nut on the manual water shutoff valve and pull the water regulator assembly out *(see Figure 16)*.
4. Remove the filter screen and install the replacement filter.
5. Reposition the water regulator assembly in the manual shutoff valve outlet and tighten the compression nut.
6. Open the manual water shutoff valve.
7. Move the master on/off toggle to the ON position *(see Figure 2 on page 3)*.
8. Check the compression nut fitting for leaks.
9. Check for uninterrupted water flow by operating the syringe for a minute.

Maintenance

Handpiece Controls
Handpiece Flush .....page 9
Oil Collector .....page 12
Utility Controls
System Air and Water
Pressure Adjustments .....page 20
Filter Maintenance
Air and Water Filter Elements.....page 22
Water Filter Screen ..... page 24

Also refer to the following A-dec documentation for more maintenance information:

Autoclavable Syringe
Autoclavable Syringe
Owner's Guide *.....85.0680.00*

Care Instructions
Equipment Asepsis
Owner's Guide *.....85.0696.00*

Self-contained Water
Owner's Guide *.....85.0675.00*

Power Supplies
Floor Boxes
Owner's Guide *.....85.2611.00*

Adjustments and Specifications

Handpiece Controls
- Drive Air Pressure.....page 6
  (Refer also to your handpiece documentation for the manufacturer's dynamic drive air pressure specification.)
- Coolant Air Flow .....page 7
- Coolant Water Flow .....page 8
- Handpiece Holder .....page 10

Service Requirements for Unit Operation:

Minimum Air:
2.50 cfm (70.80 l/min) at 80 psi (551 kPa)

Minimum Water:
1.50 gpm (5.68 l/min) at 40 psi (276 kPa)

Minimum Vacuum:
12 cfm (339.84 l/min)
at 8 inches of mercury (27 kPa)

Any optional non-A-dec attachments and/or accessories must comply with EN 60601-1 and EN 60601-1-2.

Wall Mount Specifications:

100 lb (45.36 kg) maximum unit weight.

100 ft-lb (136 N·m) maximum moment created at the wall by the freestanding unit.

Weights of optional attachments:
Touch Pad: .5 lb (.23 kg)
Tooth Dryer: 1 lb (.45 kg)
Intra-Oral Light Sources: 1 lb (.45 kg)
Scaler: 2 lb (.91 kg)
Curing Light: 3 lb (1.36 kg)

Specifications are subject to change without notice.

Identification of Symbols

Recognized by Underwriters Laboratories Inc. ® with respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1. Recognized with respect to electric shock, fire, mechanical and other specified hazards only in accordance with CAN/CSA C22.2, No. 601.1.

UL listed to US (UL 544) and Canadian (CAN/CSA C22.2, No. 125) safety standards.

Classified by Underwriters Laboratories Inc. ® with respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1. Classified with respect to electric shock, fire, mechanical and other specified hazards only in accordance with CAN/CSA C22.2, No. 601.1.

Conforms to European Directives *(refer to Declaration Statement)*

Protective earth (ground).

Functional earth (ground).

Attention, consult accompanying documents.

TYPE B APPLIED PART.

CLASS II EQUIPMENT.

Classification of Equipment (EN 60601-1)

Type of shock protection:

CLASS I EQUIPMENT
(Dental Chairs, Dental Lights, & Power Supplies)

CLASS II EQUIPMENT
(Chair, Wall, & Cart Mounted Delivery Systems)

Degree of shock protection:
TYPE B APPLIED PART (All products)

Degree of protection against water ingress:

ORDINARY EQUIPMENT (All products)

Mode of operation
CONTINUOUS OPERATION
(All models except Dental Chairs)

Mode of operation
CONTINUOUS OPERATION
WITH INTERMITTENT LOADING (Dental Chairs)

Notes

Notes

a-dec

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